also ensure that the opportunity to "get it right" in the digital environment is not squandered.

Another development expected in cable television distribution techniques relates to program guides. As the number of channels increases, so does the subscriber's need to manage the flow of information about them and make selections among them. Capabilities will be needed to identify the kinds of programming available at any particular time so that the consumer can identify shows of potential interest. Consistent with the congressional requirements to "assure . . . compatibility" of consumer electronics equipment and to "promote the commercial availability" of remotes and converter boxes, it will be necessary to disclose specifications concerning program guides to the extent necessary to permit the development of program guide management functions in consumer products (e.g., TV receiver presentation format, cursor navigation). Once again, standardization and disclosure of interoperation information will be crucial to this effort.[66]

66/ We feel strongly that features such as program guides should be included in competitive consumer electronics equipment and not reserved to the monopoly domain of the cable service provider. Congress apparently agrees, since "the need to prevent theft of service" is the only interest to be balanced against the opportunity for "cable subscribers [to] be able to enjoy the full benefit of both the programming available on cable systems and the functions available on their televisions and video cassette recorders." Communications Act of 1934, § 624A(b)(1). It is therefore important that data streams that can be used to support

(Footnote 66 continued on next page)

Even this does not fully describe the range of potential compatibility problems. One senior cable industry executive was quoted last year as saying:

> "Between fiber and microprocessors and digital processing chips that allow compression and digital storage and digital switching and a variety of other supporting technologies, we're at the point where we can deliver essentially anything we can think up. Anything we can think up that has to do with entertainment -- electronic entertainment -- or communications, or electronic education, we can deliver. We can make a box to deliver it. Maybe an expensive box -- it could be a real expensive box."[67]

Another cable executive in the same article made related statements:

> The cable industry has been quietly moving into consumer homes in this country with a very sophisticated little box. It's got a microprocessor in it, and the newest models have text generators and can tune many channels and provide a variety of consumer functions. Most of the boxes are still on the crude side, but they get changed out on a fairly short cycle. And they get changed out without waiting for the consumer to make a purchase decision. It's part of a closed system that we control.[68]

These statements encapsulate the complexity of the compatibility problems faced by consumer electronics

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(Footnote 66 continued from previous page)
consumer electronics features be available at the consumers' equipment and not stripped off at the cable head-end or the converter box.

67/ "Forging Cable's Technology Future," Broadcasting, at 35, 38 (May 4, 1992)(emphasis added).

68/ Id. at 36 (emphasis added).

manufacturers and by consumers. They also highlight the urgent need for corrective action by the Commission.

Consumer Electronics. As for developments in consumer electronics products, we have already explained why our ability to comment is limited. Nonetheless, a few trends can be discussed.

The most significant developments relate to the increased deployment of digital capabilities in home electronics devices. The blurring of distinctions between communications and computing has been discussed at the Commission for fully two decades (since the First Computer Inquiry), but only recently has this trend become apparent in the home environment. Video storage and processing capabilities are now increasingly common in personal computers, and it is no longer unusual to connect a terrestrial broadcast or cable signal input to a home computer. Meanwhile, the digital memory and computing power of some models of televisions has increased substantially, and this trend is likely to accelerate in the advanced television environment of tomorrow.

The full ramifications of these trends can scarcely be imagined. In the short term, the increased capacity is likely to be used for such functions as closed-captions (for which decoding and display capabilities are mandatory on all TVs with screen sizes over 13" manufactured

on or after July 1, 1993), teletext and extended data services, and electronic program guides.[69] As widescreen receivers become more common, picture-outside-picture is likely to become a standard feature (to fill the extra space on a 16x9 screen when 4x3 NTSC programs are being viewed). We anticipate that many additional features, such as scan-by-format and point-and-click ("air mouse"), will be introduced in TVs and VCRs, limited only by constraints of imagination -- and compatibility.

As we enter the world of "multimedia" presentations in the home, with both analog and digital signal delivery via cable, one likely consequence is that additional compatibility problems will arise, stifling the development of new consumer product innovations. These problems can be avoided only if the signals delivered by cable are standardized. With standardized cable signals,

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69/ The system used for closed-captioning has additional capacity which can be used to provide new and innovative data services. Examples include capabilities to set clocks automatically in TVs and VCRs, emergency broadcast messages, program guides, and, in general, most cable-related services. These extended data services can use the decoding and display capabilities that are required to be included in TVs for captioning purposes. See generally Amendment of the Rules Relating to Permissible Uses of the Vertical Blanking Interval of Broadcast Television Signals, 8 FCC Rcd 90 (1992) (final decision pending).

new features and functions can be integrated into consumer products rather than provided by external boxes.[70]

IX. Implementation Schedule for the New Regulations.

The Notice also seeks comments (¶ 18) about the timetable for implementation of the regulations that will be adopted in this proceeding. We believe that significantly different considerations apply to different measures. A few modest steps that are explicitly required by the Act can be adopted and implemented quite quickly, but these will scarcely begin to address the core problems Section 17 seeks to remedy. Other, more substantial measures, of the sort necessary to resolve the bulk of the core problems, will probably take a full year (by the deadline of April 1994) to develop and several years thereafter to implement fully.[71] There may be a small residue of additional compatibility problems that will take the better part of a decade to eliminate.

Certain aspects of the regulations required by the statute can be implemented with minimal delay; there is surely no need for the Commission to wait until April 1994

70/ This kind of migration of functionalities -- from devices provided as a bundled element of a monopoly service into intensely competitive consumer electronics devices -- is clearly beneficial to the consumer and is very much what Senator Leahy hoped to accomplish.

71/ Some in industry refer to these measures, collectively, as the "85 percent solution."

to adopt all of the necessary regulations. The consumer notification, wiring option, and remote control requirements of Sections 624A(c)(2)(B)(i)&(ii), (D)(i)&(ii), and (E) could be promulgated this summer and effective by Labor Day.[72] Initial steps to implement Section 624A(c)(2)(C) -- to promote the independent availability of converter boxes -- could also be taken over the same time frame.

These, however, scarcely scratch the surface of the compatibility problems Congress instructed the Commission to solve. Those problems relate to such fundamental issues as the permissibility of scrambling (§ 624A(b)(2)) and the other steps necessary to "assure . . . compatibility" between cable systems and consumer electronics equipment (§ 624A(b)(1)). Even with good faith cooperation by the parties, developing the best solutions will take some time, and implementation by industry may have to stretch out over a period of years.[73] An intermediate time-frame may apply to the definition of "cable-ready" when applied to TVs and VCRs (§ 624A(c)(2)(A)); the contents of

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72/ The terms of the notice required to be given to consumers are essentially complete, and the cable industry has already

this definition may appear to be relatively easy to determine, but it is necessarily intertwined with considerations of cable service characteristics and therefore cannot reasonably be addressed as quickly as the genuinely short-term issues discussed above.

X. Conclusion.

We welcome the opportunity to provide these preliminary comments to the Commission. In the coming months, we hope to continue the constructive discussions that have already begun between the consumer electronics and

cable industries and to work with the Commission toward adoption of measures that make cable service more "consumer-friendly."

Respectfully submitted,

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